

In the Claims:

Claims 1-53 (Canceled)

54. (Previously Amended) Apparatus as claimed in Claim 103 in which the feed of sheet material through the nip zone is effected by the roll set at least while there is tool-sheet engagement.

55. (Previously Amended) Apparatus as claimed in Claim 103 in which feed of sheet material through the nip zone is effected by the second drive at least for part of the time that there is no tool-sheet engagement.

56. (Currently Amended) Apparatus as claimed in Claim 88 in which the ~~roll set is~~ take-up rolls are provided with two or more circumferentially spaced sheet-processing tools.

57. (Currently Amended) Apparatus as claimed in Claim 56 in which the ~~roll set is~~ take-up rolls are provided with a traction section trailing one of the tools for imparting feed motion to the sheet material subsequent to disengagement between said one tool and the sheet.

58. (Previously Amended) Apparatus as claimed in Claim 103 in which the second drive is a variable speed drive operable to vary the speed profile of sheet material feed through the nip zone.

59. (Currently Amended) Apparatus as claimed in Claim 83 ~~including~~ wherein the restraining means comprises braking means for braking or damping freewheeling of said drive transmitting arrangement so that freewheeling is arrested substantially immediately upon disengagement of the sheet from the drive transmitting ~~means~~ arrangement.

60. (Previously Amended) Apparatus as claimed in Claim 83 in which the drive transmitting arrangement comprises rollers which engage the sheet material.

61. (Canceled)

62. (Canceled)

63. (Previously Amended) Apparatus as claimed in Claim 103 in which, during roll driven sheet material feed, the second drive is arrested or operates at a reduced drive speed compared with the roll drive speed.

64. (Previously Amended) Apparatus as claimed in Claim 103 in which, immediately prior to transfer of sheet material feed from the second drive to the roll set or *vice versa*, the second drive is programmed to run at a speed which is reduced compared with the roll speed.

65. (Previously Amended) Apparatus as claimed in Claim 103 in which, during the interval leading up to transfer of sheet material feed from the second drive to the roll set or *vice versa*, the second drive operates in a mode in which its speed exceeds the roll speed and is then adjusted to a lower speed.

66. (Previously Added) Apparatus as claimed in Claim 65 in which said lower speed is less than the roll speed.

67. (Previously Amended) Apparatus as claimed in Claim 103 in which the co-ordinating means is programmable in dependence upon the configuration of tool operations to be performed on the sheet.

68. (Previously Amended) Apparatus as claimed in Claim 103 in which the sheet material is fed to the roll set as discrete blanks.

69. (Canceled).

70. (Currently Amended) Apparatus as claimed in Claim 83 in which the drive transmitting arrangement driven by the servo-motor comprises a bed of rollers within the surface of the table which may be rotatably driven to advance the lowermost sheet beneath the gate to the take-up mechanism and ~~in which means is provided for restraining freewheeling roller feed of the next lowermost sheet after the sheet being fed has passed under the gate.~~

71. (Canceled)

72. (Currently Amended) Apparatus as claimed in Claim 83 in which the drive transmitting arrangement driven by the servo motor comprises conveyor means associated with the feed surface table for advancing the lowermost sheet beneath the gate to the take-up mechanism ~~and~~

~~in which means is provided for restraining freewheeling feed of the next lowermost sheet after the sheet being fed has cleared the conveyor means.~~

73. (Previously Added) Apparatus as claimed in Claim 72 in which the conveyor means comprises roller means which directly engage with the lowermost sheet.

74. (Previously Added) Apparatus as claimed in Claim 72 in which the conveyor means comprises roller means which contact the lowermost sheet indirectly through one or more conveyor belts entrained around the roller means.

75. (Currently Amended) Apparatus as claimed in Claim 70 in which the restraining means comprises brake means acting on the rollers ~~or conveyor means~~.

C 76. (Currently Amended) Apparatus as claimed in Claim ~~70~~ 72 in which the restraining means comprises vacuum suction means located upstream of the ~~rollers or conveyor means~~ to hold the next lowermost sheet against the action of the freewheeling rollers after the sheet being fed has passed under the gate.

77. (Previously Added) Apparatus according to Claim 70 in which the take-up mechanism comprises a tool-carrying roll set.

78. (Currently Amended) Apparatus according to Claim ~~70~~ 72 in which the ~~rollers or conveyor means are~~ is fitted with sprag clutches and advance the sheet being fed at substantially the same speed as, or a slower speed than that of, the take-up mechanism.

79. (Currently Amended) Apparatus according to Claim ~~70~~ 72 in which the ~~rollers or conveyor means are~~ is driven by a servo electric motor which alternately drives the rollers ~~or conveyor means forwardly and stops, the timing of the motor being controlled by the processing machinery.~~

80. (Currently Amended) Apparatus according to Claim ~~70~~ 72 wherein vacuum suction is applied from beneath the ~~rollers or conveyor means~~ to pull the lowermost sheet downwardly against the rollers.

81. (Previously Added) Apparatus according to Claim 70 wherein the rollers are rotatably interconnected by timing drive belt means, one of which rollers is driven by a further timing drive belt.

82 (Canceled)

83. (Currently Amended) Apparatus for ~~feeding sheet material sequentially on demand to processing sheet material, comprising:~~ a take-up mechanism of sheet processing machinery, said apparatus comprising a feed table having a gate and upon which sheets may be stacked against the gate which allows only the lowermost sheet to pass therebeneath, a drive transmitting arrangement driven by a servo-motor to advance the lowermost sheet beneath the gate to the take-up mechanism, a sensing means between the gate and the take-up mechanism to detect the passage of a datum position of the sheet, and a microprocessor which receives data indicating the position of the take-up mechanism and from the sensing means and which is programmed to control the servo-motor to ensure that the sheet presents itself to the take-up mechanism at the correct instant, the arrangement being such that, when the take-up mechanism commences to feed the sheet, the drive transmitting means arrangement operates automatically in a freewheel mode while in engagement with the sheet, the arrangement being such that, when the take-up mechanism commences to feed the sheet, the drive transmitting arrangement operates automatically in a freewheel mode while in engagement with the sheet said apparatus further including restraining means for restraining feed of the next lowermost sheet by overrun of the freewheeling drive transmitting arrangement after the sheet being fed has cleared said drive-transmitting arrangement.

84. (Canceled)

85. (Previously Added) Apparatus according to claim 83 wherein the microprocessor is programmed to ensure that the leading edge of the sheet presents itself to the take-up mechanism at a desired speed.

86. (Previously Added) Apparatus according to claim 85 wherein the desired speed is slightly less than the speed at which the take-up mechanism forwards the sheet.

87. (Previously Added) Apparatus according to claim 85 wherein the desired speed is zero.

88. (Previously Added) Apparatus according to Claim 83 wherein the take-up mechanism comprises a pair of take-up rolls.

89-102. (Canceled).

103. (Previously Added) Apparatus according to claim 88 in which said rolls are provided with one or more sets of sheet-processing tooling for engagement with, and for imparting drive to, the sheet material in the nip zone between the roll set and further comprising a first drive for rotating the roll set so that the sheet material is driven through the nip while engaged by at least one of the sets of tooling, a second drive including said servomotor upstream of the nip zone for effecting feed of the sheet material, and means operable to co-ordinate operation of the second drive with rotation of the roll set in such a way that sheet feed through and beyond the nip zone is effected in part by the roll set and in part by the second drive.

104. (New) An apparatus for feeding sheet material on demand to a take-up mechanism of sheet processing machinery, comprising:

a feed table having a gate and upon which sheets may be stacked against the gate which allows only the lowermost sheet to pass therebeneath;

a drive mechanism driven by a servo-motor to advance the lowermost sheet beneath the gate to the take-up mechanism;

a sensor adapted to be located between the gate and the take-up mechanism that detects the passage of a datum position of the sheet;

a microprocessor that is adapted to receive data indicating the position of the take-up mechanism and data from the sensor and which controls the servo-motor to ensure that the sheet presents itself to the take-up mechanism at the correct instant; and wherein

the drive mechanism automatically operates in a freewheel mode while still in engagement with the sheet at the same time the take-up mechanism commences to feed the sheet, the drive mechanism ceasing freewheel rotation once the sheet has cleared the drive mechanism.

105. (New) The apparatus according to claim 104, further comprising:

a brake incorporated with the drive mechanism that stops the freewheeling movement of the drive mechanism after the sheet being fed has cleared the drive mechanism.

106. (New) The apparatus according to claim 104, further comprising:

a vacuum suction device upstream of the drive mechanism for holding the next lowermost sheet against the action of the freewheeling movement of the drive mechanism after the sheet being fed has passed under the gate.

107. (New) An apparatus for processing sheet material, comprising:

a take-up roller set that is operable at a selected continuous speed;

a feed table having a gate and upon which sheets may be stacked against the gate which allows only the lowermost sheet to pass therebeneath;

U a drive roller set driven by a servo-motor to advance the lowermost sheet beneath the gate to the take-up roller set;

a sensor located between the gate and the take-up roller set that detects the passage of a datum position of the lowermost sheet;

a microprocessor that receives data indicating the rotational position of the take-up roller set and data from the sensor and which causes the servo-motor to intermittently rotate the drive roller set to present the lowermost sheet to the take-up roller set at the correct instant;

the drive roller set automatically operating in a freewheel mode while still in engagement with the lowermost sheet at the same time the take-up roller set commences to engage the lowermost sheet;

a brake that engages the drive roller set to restrain the freewheeling movement of the drive roller set after the lowermost sheet has cleared the drive roller set; and

a vacuum suction device that holds a next lowermost sheet against the action of the freewheeling movement of the drive roller set after the lowermost sheet has passed under the gate.

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